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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

E. AKAGAWA et al

Serial No. 10/629,554

Filed: July 30, 2003

For: MEDIUM FOR RECORDING NETWORK MANAGEMENT PROGRAM,  
MANAGEMENT COMPUTER AND MANAGING METHOD

PETITION TO MAKE SPECIAL  
UNDER 37 CFR §1.102(MPEP §708.02)

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Applicants hereby petition the Commissioner to make the above-identified application special in accordance with 37 CFR §1.102(d). Pursuant to MPEP §708.02(VIII), Applicants state the following.

(A) This Petition is accompanied by the fee set forth in 37 CFR §1.17(h). The Commissioner is hereby authorized to charge any additional payment due, or to credit any overpayment, to Deposit Account No. 50-1417.

(B) All claims are directed to a single invention. If the Office determines that all claims are not directed to a

single invention, Applicant will make an election without traverse as a prerequisite to the grant of special status.

(C) A pre-examination search has been conducted.

The search was directed towards a medium for recording network management program, management computer and managing method. In particular, the search was directed towards a management program executed by the management computer connected to computers and to a plurality of storage devices for managing the volumes connected to the computers through a SAN (storage area network). The management program executes a procedure for receiving a notice of fault in the volume from the storage devices, a procedure for receiving volume access control information from a plurality of storage devices for specifying the computers that can access the volumes, and a procedure for notifying the fault in the volume to the computers that are permitted to access the volumes based on the volume access control information, and as further claimed and described in the disclosure.

The search of the above features was conducted in the following areas: Class 711, subclass 217; and Class 714, subclasses 7, 20, 47, and 57.

In addition, a computer database search was performed on USPTO systems EAST and WEST. The keyword search was performed in Class 710, Subclasses 31 and 36; Class 711, subclasses 112, 113, 114, 118, 170 and 202; and Class 714, Subclasses 5, 6, 15 and 38.

(D) The following is a list of the references deemed most closely related to the subject matter encompassed by the claims:

| <u>U.S. Patent Number</u> | <u>Inventors</u> |
|---------------------------|------------------|
| 5,574,856                 | Morgan et al     |
| 5,584,008                 | Shimada et al    |
| 5,790,775                 | Marks et al      |
| 5,919,258                 | Kayashima et al  |
| 6,199,105                 | Soejima et al    |
| 6,631,442                 | Blumenau         |

  

| <u>U.S. Patent Application Publication No.</u> | <u>Inventor(s)</u> |
|--|--------------------|
| 2002/0078296                                   | Nakamura et al     |
| 2002/0129246                                   | Blumenau et al     |
| 2002/0174315                                   | Yamamoto           |
| 2003/0084237                                   | Yoshida et al      |
| 2003/0126327                                   | Pesola et al       |
| 2003/0221063                                   | Eguchi et al       |
| 2003/0229689                                   | Raghavan et al     |
| 2003/0233596                                   | Corbin et al       |
| 2004/0073831                                   | Yanai et al        |
| 2004/0083401                                   | Furukawa et al     |

  

| <u>Foreign Patent Number</u> | <u>Inventors</u> |
|------------------------------|------------------|
| JP 11085589                  | Kidokoro et al   |

A copy of each of these references is enclosed.

(E) It is submitted that the present invention is patentable over the references for the following reasons.

The present invention is directed to a network system, a recording medium and a management program as recited in the independent claims of the present application. The present invention overcomes the problem in the prior art regarding notifying of a fault in a volume accessed by a plurality of devices forming a network. For purposes of security, fault information is only provided to the host computers that are permitted to access the volumes.

Access control tables have been cumbersome in the prior art because they had to be set for each storage device. In addition, in the prior art, consideration was given to an access control table managed by a storage device. However, the storage device is often connected to a host via a fiber channel (FC) switch. Therefore, access control technology of the FC switches must also be considered.

The pending claims recite that a notice of a fault and volume access control information from a plurality of storages are received and that the fault is notified to computers which are permitted to access the volumes based on the volume access control information. It is submitted that these features of

the pending claims patentably define them over the prior art uncovered during the search.

The references believed to be most relevant to the claimed invention are discussed below.

U.S. Patent Application No. 2004/0083401 discloses a managing computer being connected to the object computers and the storage, which is connected to the object computers for managing the object computers and the storage. The managing computer includes an interface for receiving volume managing information relating to storage areas in the storage, file sharing information relating to file sharing in the storage which is provided by the object computers and storage managing information relating to the storage, and a control unit which specifies the object computers or the storage to be preset controlled according to the volume managing information, the file sharing information and the storage managing information for managing the object computers (See the Figures and sections [0009]-[0015]).

U.S. Patent Application No. 2003/0229689 discloses a method and system for managing stored data on a computer network that organizes data into logical volumes, and each logical volume has a friendly name associated with it. The system includes a SAN domain controller (206) executing

several program modules, including a security module (218) for authenticating hosts and controlling access to storage devices on the storage area network (202), a discovery module (220) for enabling storage devices on the storage area network (202) to be automatically recognized by the SAN domain controller (206), a LUN management module (222) for keeping track of the logical unit numbers of various logical volumes on the storage area network (202) and a name space management module (224) for keeping track of how friendly names are mapped to network paths for the various logical volumes on the network (See Figures and sections [0026]-[0028]).

U.S. Patent Application Number 2002/0129246 shows a data processing system having facilities for ensuring that the logical storage volumes (28, 29, 30, and 31) are accessible to the hosts (22, 23, 24, and 25). The storage area network provides fault tolerance and fail over capability for hosts and storage subsystems in the network (See figures, claims and sections [0052]-[0071]).

The remaining documents are of general interest and are discussed as follows:

U.S. Patent No. 5,574,856 discloses a fault indication method in which the fault indication enables a user to

determine the identity of a data storing related operation that was in progress when the fault occurred (see Abstract).

U.S. Patent No. 5,584,008 discloses that if an abnormality occurs data can be reconstructed from redundant data. The disk array apparatus has an array structure in which data are divided into a plurality of parts, redundant data are added respectively to them, and resultant data are stored in a plurality of storage devices (see column 5, lines 42-59).

U.S. Patent No. 5,790,775 discloses that a controller is capable of assuming the identity of a failed controller while continuing to respond to its own SCSI ID or IDs in such a way that all SCSI IDs and associated LUNS of the failed controller are effectively overtaken by the surviving controller (see Abstract).

U.S. Patent No. 5,919,258 discloses a security system in which one of the computers monitors its internal status and if a fault occurs, information is transmitted to other computers as to the type of fault. An access control unit executes processing to protect the resources of the one computer (see Abstract).

U.S. Patent No. 6,199,105 discloses a recovery system in which in the event of a failure of a system coupling apparatus

(MSCPs) during operation of the computer system, the lock information held by all the MSCPs including the one in trouble is held distributively among the other MSCPs without having to await restoration of the MSCP that is in trouble (see column 1, lines 40-50).

U.S. Patent No. 6,631,442 discloses a volume creation and management technique that permits a volume to exist in the data storage system even if no storage devices are associated with that volume (see column 6, lines 29-49).

U.S. Patent Application Publication No. 2002/0078296 discloses providing a data duplicating method in a storage system for copying data of a plurality of logical volumes possessed by a first storage system to a second storage system. The method includes a first step of starting copying of data of one of the plurality of logical volumes to the second storage system, and a second step of starting copying data of the other logical volumes other than the one logical volume to the second storage system (see section [0011]).

U.S. Patent Application Publication No. 2002/0174315 discloses that activity of each physical storage area portion is monitored and if one portion has more activity than other storage area portions, the logical volumes management reconfigures the logical to physical storage mapping to

increase the number of logical volumes and thereby increase the number of available copies of the data. This way, high volumes of I/O requests can be more evenly distributed (see section [0012]).

U.S. Patent Application Publication No. 2003/0084237 discloses that a disk array controller having a plurality of disk array control units operate as a sole disk array controller so as to restrain deterioration of the performance of the cache memory sections of the respective disk array controlling units due to their physical packing locations and to maximize their performance thereof (see Abstract).

U.S. Patent Application Publication No. 2003/0126327 discloses a volume translation apparatus that resides between host machines and physical storage devices accessed by the host machines. This volume translation apparatus performs volume translation for the control path and optionally the data path of input/output requests sent by the host machines to the physical storage devices (see section [0010]).

U.S. Patent Application Publication No. 2003/00221063 discloses a storage subsystem that detects the necessity of data relocation and determines whether or not it is possible (see Abstract).

U.S. Patent Application Publication No. 2003/02335696 discloses an apparatus having a redundant array of storage devices that includes a logical volume of storage. A bit mapped vector provides state initialization information for each of a plurality of stripes instead of initializing each stripe and a storage controller initializes each stripe by using accesses to the redundant array (see Abstract).

U.S. Patent Application Publication No. 2004/0073831 discloses remote data mirroring such that each volume of data is configured as local, primarily in a remotely mirrored volume pair, or secondary in a remotely mirrored volume pair. A host computer can normally directly access either local or primary volumes and data written to the primary volume is automatically sent over a link to a corresponding secondary volume (see Abstract).

JP 11-085589 discloses that managing of data reconstructing for an information storage device in which when a write request is received from a host system, a logical address designated by that write request is written in a user data storage area inside a volume together with the user data of the write object. When the danger of a fault occurrence is detected, reconstruction processing is started (see English-language Abstract Item No. (57)).

Once again, it is submitted that the cited references, whether taken individually or in combination, fail to render the claimed invention unpatentable. In particular, the cited references fail to disclose that a notice of a fault and volume access control information from a plurality of storages is received and that the fault is notified to computers which are permitted to access the volumes based on the volume access control information.

CONCLUSION

It is submitted that the requirements of 37 CFR §1.102(d) have been satisfied. Accordingly, it is requested that this petition to make special be granted and the application examined according to the appropriate guidelines.

Respectfully submitted,

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